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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Koval et al.	Confirmation No.:	To be assigned
Serial No.:	To be assigned	Art Unit:	2812
Filed:	Herewith	Examiner:	To be assigned
For:	CLOSED-FORM JOSEPHSON JUNCTIONS	Attorney Docket No.:	11090-067-999

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

1. Enclosures accompanying this Information Disclosure Statement are:

1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.

1b. A legible copy of :

☐ Each U.S. patent application publication and U.S. and foreign patent;

☐ Each publication or that portion which caused it to be listed on the PTO-1449;

☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;

☐ all other information or portion which caused it to be listed on the PTO-1449.

1c. ☐ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.

1d. ☐ Explanations of relevancy (ATTACHMENT 1(d), hereto) or English language abstracts of the non-English language publications.

2. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):
☐ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);

☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;

☐ Before the mailing of the first Office action on the merits;

☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

3. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

(Check either Item 3a or 3b)

3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

3b. ☐ The $180.00 fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is:
☐ enclosed
☐ to be charged to Pennie & Edmonds LLP Deposit Account No. 16-1150.

(Item 3b to be checked if any reference known for more than 3 months)

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

The Certification Statement in Item 5 below is applicable.

The $180.00 fee set forth in 37 C.F.R. §1.17(p) is:
☐ enclosed.
☐ to be charged to Pennie & Edmonds LLP Deposit Account No. 16-1150.

5. ☐ Certification Statement (applicable if Item 3a or Item 4 is checked)

(Check either Item 5a or 5b)

5a. ☐ In accordance with 37 C.F.R. §1.97(e)(1), it is certified that each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

5b. ☐ Each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

5c. ☐ Pursuant to 37 C.F.R. §1.704(d), each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

6. ☒ This application is a continuation application under 37 C.F.R. §1.60 or §1.53(b) or (d).

(Check appropriate Items 6a, 6b and/or 6c)

6a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.

6b. ☒ Copies of publications listed on Form PTO-1449 from prior application Serial No. 10/233,211, filed on August 28, 2002, of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

6c. ☐ Copies of the publications listed on Form PTO-1449 were not previously cited in prior application Serial No. , filed on , and are provided herewith.

7. ☐ This is a Supplemental Information Disclosure Statement. (Check Item 7a)

7a. ☐ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on . A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on .

8. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

(Check Item 8a, 8b, or 8c)

8a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.

8b. ☐ set forth in the application.

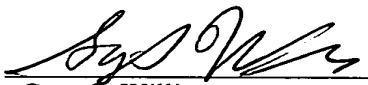
8c. ☐ enclosed as an attachment hereto.

9. ☒ The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Pennie & Edmonds LLP Deposit Account No. 16-1150.

10. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: December 11, 2003



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U.S. Department of Commerce, Patent and Trademark Office	Atty Docket No.	Serial No.
	11090-067-999	To be assigned
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Applicant(s)	
(Use several sheets if necessary)	Koval et al	
	Filing Date	Group
	Herewith	2812

U.S. Patent Documents

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	4,749,888	6/07/88	Sakai et al.			
	AB	09/637,514	9/30/2003	Ustinov et al.			8/11/2000

Foreign Patent Documents

		Document	Date	Country	Class	Subclass	Yes	No
	AC	JP5190922A2	7/30/93	Japan				
	AD	WO 02/15290 A1	2/21/2002	WIPO				
	AE	0 746 844 A1	3/25/1992	EPO				

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

	AF	M. Aoyagi, M. Maezawa, H. Nakagawa, and I. Kurosawa, "Fabrication of Submicron Nb/AlO_x/Nb Josephson junctions using ECR plasma etching technique", IEEE Transactions on Applied Superconductivity, 7, pp. 2644-2648 (1997)
	AG	M.F. Bocko, A.M. Herr, and M.J. Feldman, "Prospects for quantum coherent computation using superconducting electronics", IEEE Transactions on Applied Superconductivity, 7, pp. 3638-3641 (1997)
	AH	J.-G. Caputo, N. Flytzanis, and E. Vavalis, "Effect of geometry on fluxon width in a Josephson junction", International Journal of Modern Physics C, 7, pp. 191-216 (1996)
	AI	M.G. Castellano, G. Torrioli, C. Cosmelli, A. Costantini, F. Chiarello, P. Carelli, G. Rotoli, M. Cirillo, and R. L. Kautz, "Thermally activated escape from the zero-voltage state in long Josephson junctions", Physical Review B, 54, pp. 15417–15428 (1996)
	AJ	M. Cirillo, T. Doderer, S.G. Lachenmann, F. Santucci, and N. Grønbech-Jensen, "Dynamical evidence of critical fields in Josephson junctions", Physical Review B, 56, pp. 11889-11896 (1997)
	AK	A. Davidson, B. Dueholm, and N.F. Pedersen, "Experiments on soliton motion in annular Josephson junctions," Journal of Applied Physics, 60, pp. 1447-1454 (1986)
	AL	Davidson et al., "Experimental investigation of trapped sine-gordon solitions", Physical Review Letters 19, pp.2059-2062 (1985).
	AM	T. Dröse and C. Morais-Smith, "Metastability in Josephson transmission lines", Physical Review B, 61, pp. 1506-1515 (2000)

Examiner	Date Considered

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
	AN	M.J. Feldman, "Josephson Junctions Digital Circuits – Challenges and Opportunities," [published in Japanese] FED Review, FED Superconducting Project: Josephson Device Hybrid System (FED, Tokyo, 1998) pp. 23-46. [This manuscript was submitted in English (1/2/1998) for Translation to Japanese.]
	AO	A. Franz, A. Wallraff, and A.V. Ustinov, "Magnetic field penetration in a long Josephson junction imbedded in a wide stripline", Journal of Applied Physics, 89, pp. 471-476 (2000)
	AP	A. Franz, A. Wallraff, and A.V. Ustinov, "Measurements of the critical current diffraction patterns in annular Josephson junctions", Physical Review B, 62, pp. 119-122 (2000)
	AQ	F. Gaitan, "Berry phase modification of the current drive in a restricted class of large annular Josephson junctions at low temperature", Physical Review B, 63, 104511/1-104511/10 (2001)
	AR	E. Goldobin, A. Wallraff, N. Thyssen, and A.V. Ustinov, "Cherenkov radiation in coupled long Josephson junctions", Physical Review B, 57, pp. 130-133 (1998)
	AS	D. Gupta and Y. Zhang, "On-chip clock technology for ultrafast digital superconducting electronics", Applied Physics Letters, 76, pp. 3819-3821 (2000)
	AT	T. Kato and M. Imada, "Macroscopic quantum tunneling of a fluxon in a long-Josephson junction", Journal of the Physical Society Japan, 65, pp. 2963–2975 (1996)
	AU	Yu. Koval, A. Wallraff, M. Fistul, N. Thyssen, H. Kohlstedt, and A.V. Ustinov, "Narrow long Josephson junctions", IEEE Transactions on Applied Superconductivity, 9, pp. 3957-3961 (1999)
	AV	A.W. Lichtenberger, D.M. Lea, F.L. Lloyd, M.J. Feldman, R.J. Mattauch, S.-K. Pan, and A.R. Kerr, "Fabrication of micron size Nb/Al-Al_2O_3/Nb junctions with a trilevel resist liftoff process", IEEE Transaction on Magnetics, 27, pp. 3168-3171 (1991)
	AW	Yu. Makhlin, G. Schön, and A. Shnirman, "Quantum-state engineering with Josephson-junction devices", Reviews of Modern Physics, 73, pp. 357-400 (2001)
	AX	J.E. Mooij, T.P. Orlando, L. Levitov, L. Tian, C.H. van der Wal, and S. Lloyd, "Josephson persistent-current qubit", Science 285, pp. 1036-1039 (1999)
	AY	N.F. Pedersen, "Fluxon electronic devices", IEEE Transactions on Magnetics, 27, pp. 3328-3334 (1991)
	AZ	A.V. Ustinov, T. Doderer, B. Mayer, R.P. Huebener, and V.A. Oboznov, "Trapping of several solitions in annular Josephson junctions", Europhysics Letters, 19, pp. 63-68 (1992)
	AAA	A.V. Ustinov, B.A. Malomed, and N. Thyssen, "Soliton trapping in a periodic potential: experiment", Physics Letters A, 233, pp. 239-244 (1997)
	ABB	A.V. Ustinov, "Solitons in Josephson junctions", Physica D, 123, pp. 315-329 (1998)
	BA	H. Pressler, T. Doderer, S. Keil, D. Kruse, and A. Laub, "Experimental observation of fluxon bunching in Josephson tunnel junctions", Physics Letters A, 244, pp. 149-154 (1998)
	BB	I. Vernik, V.A. Oboznov, and A.V. Ustinov, "Observation of supersoliton resonances in the modulated annular Josephson junction", Physics Letters A, 168, pp. 319-325 (1992)

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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
	BC	I. Vernik, V. Vernik, N. Lazarides, M.P. Sørensen, A.V. Ustinov, N.F. Pedersen, and V.A. Oboznov, "Soliton bunching in annular Josephson junctions", Journal of Applied Physics, 79, pp. 7854-7859 (1996)
	BD	A. Wallraff, "Fluxon Dynamics in annular Josephson junctions: From relativistic strings to quantum particles", PhD thesis, University of Erlangen-Nurnberg, Germany, (2000)
	BE	A. Wallraff, Yu. Koval, M. Levitchev, M.V. Fistul, and A.V. Ustinov, "Annular long Josephson junctions in a magnetic field: Engineering and probing the fluxon potential", Journal of Low Temperature Physics, 118, pp. 543-553 (2000)
	BF	A. Wallraf, A.V. Ustinov, V.V. Kurin, I.A. Shereshevsky, and N.K. Vdovicheva, "Whispering Vortices", Physical Review Letters, 84, pp. 151-154 (2000)
	BG	Y. Zhang and D. Gupta, "Low-jitter on-chip clock for RSFQ circuit applications", Superconductor Science and Technology, 12, pp. 769-772 (1999)
	BH	R. H. Hadfield et al. 2002, "Novel Josephson junction geometries in NbCu bilayers fabricated by focused ion beam microscope" Physica C 367, 267.
	BI	M. P. Lisitskii et al. 2000, "Annular Josephson junctions for radiation detection: fabrication and investigation of the magnetic behaviour" Nuclear Instruments and Methods in Physics Research A 444, 476.
	BJ	A. Potts et al. 2001, "CMOS compatible fabrication methods for submicron Josephson junction qubits" IEEE Proc. 148, 225.

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